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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/603,053	06/26/2000	Hiroshi Shimanuki	CSC-018	3796

959 7590 10/21/2003

LAHIVE & COCKFIELD
28 STATE STREET
BOSTON, MA 02109

EXAMINER

CREPEAU, JONATHAN

73

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/603,053

Applicant(s)

SHIMANUKI ET AL.

Examiner

Jonathan S. Crepeau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5,7-10,12 and 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4,7,10,12 and 14 is/are rejected.
- 7) ☒ Claim(s) 2,5,8 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1, 2, 4, 5, 7-10, 12, and newly added claim 14. Claim 14 is newly rejected under 35 USC §102, and claims 1, 4, 7, 10, and 12 are newly rejected under 35 USC §103, as necessitated by amendment. Claims 2, 5, 8, and 9 are objected to as containing allowable subject matter. Accordingly, this action is made final.

Claim Objections

2. Claims 2 and 8 are objected to because of the following informalities: in line 1 of both claims, "systems" should be "system." Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 14 is rejected under 35 U.S.C. 102(b) as being anticipated by JP 11-40180. The reference is directed to a fuel cell system provided with a fuel cell (1) (see abstract and Fig. 1). The system further comprises a gas/liquid separator (8) for separating discharged components from the fuel cell. A cooling medium is supplied to the separator for performing heat exchange with the discharged components (see abstract). The flowrate of the cooling medium is controlled

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by controlling the rotational speed of a pump (5) (see paragraph 28 of the machine translation).

As disclosed in paragraph 29, the outlet temperature of the gas/liquid separator is kept at a constant value (i.e., it is "set") and is monitored by a temperature sensor (7). This outlet temperature changes in accordance with the flowrate of the cooling medium (see paragraphs 29 and 30). Furthermore, the amount of discharged water changes in accordance with the flowrate and exit temperature of the cooling medium (see paragraphs 29 and 30).

Thus, the instant claim is anticipated.

Claim Rejections - 35 USC § 103

5. Claims 1, 4, 7, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11-40180 in view of Meltser et al (U.S. Patent 5,763,113).

Regarding claims 1, 4, 7, 10, and 12, JP 11-40180 is directed to a fuel cell system provided with a fuel cell (1) (see abstract and Fig. 1). The system further comprises a gas/liquid separator (8) for separating discharged components from the fuel cell. A cooling medium is supplied to the separator for performing heat exchange with the discharged components (see abstract). Regarding claims 1, 7, and 10, the flowrate of the cooling medium is controlled by a pump (5) (see paragraph 28 of the machine translation). The pump is controlled responsive to the amount of water discharged from the separator, thereby controlling the flowrate of the cooling medium (see paragraph 28). Regarding claims 4, 7, and 12, the temperature of the cooling medium may also be controlled by adjusting the speed of the fan (9) responsive to the water level measurement as the cooling medium passes through a radiator (see paragraph 36).

Regarding claims 1, 4, 7, 10, and 12, the amount of discharged water inherently changes depending on an "operation condition" (i.e., current or voltage) of the fuel cell (see, e.g., Figure 2 of the instant application).

JP '180 does not expressly teach that the operation condition is detected by means for detecting the current value or voltage value from the fuel cell, as recited in claims 1, 4, 7, 10, and 12.

Meltser et al. is directed to a PEM fuel cell monitoring system. The system includes stack current and voltage monitors as well as a hydrogen gas sensor in the cathode output (see abstract; col. 5, line 5). Outputs from the voltage and hydrogen sensors are compared to predetermined levels of acceptability and the operator is alerted if an undesirable condition exists (see abstract).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the monitoring system of Meltser et al. in the fuel cell of JP '180. In column 1, line 66, Meltser et al. teach that "[t]he present invention contemplates method and apparatus for monitoring the performance of a stack of PEM fuel cells, and automatically triggering corrective measures (e.g., alert operator and/or initiate preventative action) when the performance degrades to an unacceptable level, as for example, may occur incident to CO poisoning of the anode catalyst, water flooding of one or more the cells and/or excessive hydrogen invasion of the cathode gas." Accordingly, this teaching would provide sufficient motivation to use the monitoring system of Meltser et al. (i.e., the current, voltage, and hydrogen sensors) in the fuel cell of JP '180.

Allowable Subject Matter

6. Claims 2, 5, 8, and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

Claims 2 and 8 recite, among other features, that the output of the pump is controlled on the basis of information detected by the means for detecting current or voltage. Claims 5 and 9 recite, among other features, that the output of the cooling fan is controlled on the basis of information detected by the means for detecting current or voltage. As noted above, JP 11-40180 teaches a cooling loop comprising a pump and a fan. However, the reference does not teach that the pump and the fan are controlled responsive to the current or voltage of the fuel cell stack. JP 11-339830 teaches a stack current detector (10) for controlling a valve (42) in a fuel cell cooling loop. However, there would not be sufficient motivation to use the current detector of JP '830 to measure the current of the stack of JP '180 and control the fan and the pump. The cooling loop of JP '830 is a primary fuel cell cooling loop, i.e., it circulates coolant directly to the fuel cell. The cooling loop of JP '180 which contains the pump and fan is a secondary cooling loop, i.e., it performs heat exchange with the primary cooling loop and with exhaust streams from the fuel cell. Thus, since the current sensor of JP '830 is only used in connection with the primary cooling loop, there would not be sufficient motivation to apply this teaching to the secondary cooling loop of JP '180. Accordingly, claims 2, 5, 8, and 9 contain allowable subject matter.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051 (prior to December 17, 2003) or (571) 272-1299 (after December 17, 2003). The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

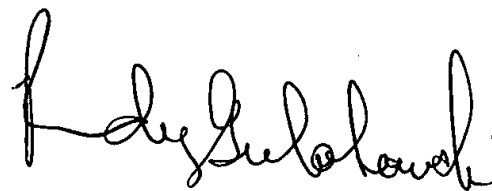
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (703) 308-4333. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally, documents may be faxed to (703) 872-9310 (for non-final communications) or (703) 872-9311 (for after-final communications).

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Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JSC

October 9, 2003

A handwritten signature in black ink, appearing to read "Randy Gulakowski". The signature is fluid and cursive, with a large initial "R" and "G".

RANDY GULAKOWSKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700